

DIAION^(R) & SEPABEADS^(R) Synthetic Adsorbents

MITSUBISHI
CHEMICAL

● GENERAL FEATURE

Synthetic adsorbents are a series of products based on ion-exchange resin manufacturing technology, and are designed for the uses as solid extractant. Synthetic adsorbents have large surface area and fine pore structures inside the particle like activated carbon. For this porous characteristic, they can effectively adsorb organic compounds from aqueous solutions. Extraction processes with synthetic adsorbents enables reducing solvent amount and safer operations compared with conventional solvent extraction techniques.

● PROPERTIES

A synthetic adsorbent is spherical particle, and inside it, there exist effective fine pore structures suitable for the diffusion of solutes



Smaller solutes can penetrate into the particle by diffusing through the pores, when a solution is allowed to contact with adsorbent particles.

On the contrary, molecules that are larger than pore size cannot penetrate into the inside of particle. Consequently, such molecules are not adsorbed on synthetic adsorbents (this phenomenon is so-called molecular sieving effect).

● APPLICATION FIELDS

Synthetic adsorbents are used for the separation of valuable compounds from plant extracts and fermentation products for pharmaceutical intermediates and food additives.

● STABILITY

Synthetic adsorbents are stable in acidic, alkaline solutions and in organic solvents, and they can be easily regenerated under mild conditions for repeated uses.

Types of Synthetic adsorbents and Selection Guide

● CHEMICAL STRUCTURE

There are three types of chemical structures for synthetic adsorbents; aromatic, modified aromatic and methacrylic series.

The chemical structure dominates the degree of hydrophobicity of synthetic adsorbents. Hydrophobicity of adsorbent is important in selecting a suitable type of adsorbent according to the chemical nature of target compounds.

Aromatic	Aromatic type adsorbents are the standard grade and are based on crosslinked polystyrenic matrix. They are widely used in different industrial fields; extraction of antibiotic intermediates from fermentation broth, separation of peptides, or food additives, debittering of citrus juice etc.
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	DIAION ^(R) HP20 HP21 / SEPABEADS ^(R) SP825 SP850 SP70 SP700
Modified Aromatic	Modified aromatic type is based on brominated aromatic matrix which gives enhanced hydrophobicity. This type adsorbent is suitable for adsorption of organic substances of very low concentration or of highly hydrophilic substances. SEPABEADS ^(R) SP207
Methacrylic	Methacrylic type is based on methacrylic ester copolymer, and has relatively hydrophilic nature. This type of adsorbent is suitable for adsorption of polyphenols and surfactants. DIAION ^(R) HP2MG

● PORE STRUCTURE

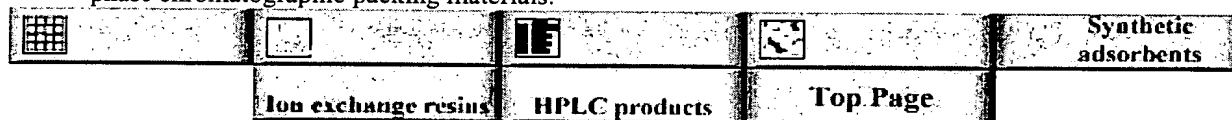
Mitsubishi Chemical supplies wide variety of synthetic adsorbents with different pore structures. The most appropriate type of adsorbent can be selected according to the pore size of adsorbent and the molecular size of the target compound (or sometimes unfavorable compounds to be removed).

Another important parameter is surface area of resins. Adsorbent with large surface area shows high uptake capacity, especially for small molecules.

● PARTICLE SIZE

Standard synthetic adsorbents have ca 0.5 mm mean particle diameter. This size is designed for most industrial scale processes.

Smaller particle size adsorbents are used for fine separation/purification applications as reversed-phase chromatographic packing materials.



For questions and comments, [Mail to: diaion@rc.m-kagaku.co.jp](mailto:diaion@rc.m-kagaku.co.jp)
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